

AMENDMENTS TO THE CLAIMS

1-3. (Canceled)

4. (Currently Amended) A beam current sensor ~~comprising~~ comprising:

a super-conductive body, which is a cylindrical body having an inner surface defining an interior and an outer surface, wherein ~~where~~ a beam passes through ~~an inner diameter side and the interior; and~~

a bridge unit to which a SQUID input coil is adjacently arranged is formed on ~~an outer diameter side, wherein~~ the outer surface;

said bridge unit comprising:

a first coil unit formed so as to have a spiral shape wound counterclockwise and having a first center; from the outer diameter side toward the inner diameter side;

a second coil unit formed so as to have a spiral shape wound clockwise and having a second center; and from the outer diameter side toward the inner diameter side; and

a connection portion for connecting the first center position ~~of the inner diameter side of~~ said first coil unit with the second center position ~~of the inner diameter side of~~ said second coil unit,

said beam current sensor ~~includes~~ comprising:

a first soft magnetic body of an approximately rectangular parallelepiped shape arranged on said first coil unit;

a second soft magnetic body of an approximately rectangular parallelepiped shape arranged on said second coil unit; and

a third soft magnetic body including an approximately U-shape, where one end portion is arranged on said first soft magnetic body side and the other end portion is arranged on said second soft magnetic body side, and which bridges said first soft magnetic body and said second soft magnetic body, ~~and~~

wherein said SQUID input coil is arranged between said first soft magnetic body and said one end portion of said third soft magnetic body and between said second soft magnetic body and said other end portion of said third soft magnetic body.

5-6. (Canceled)